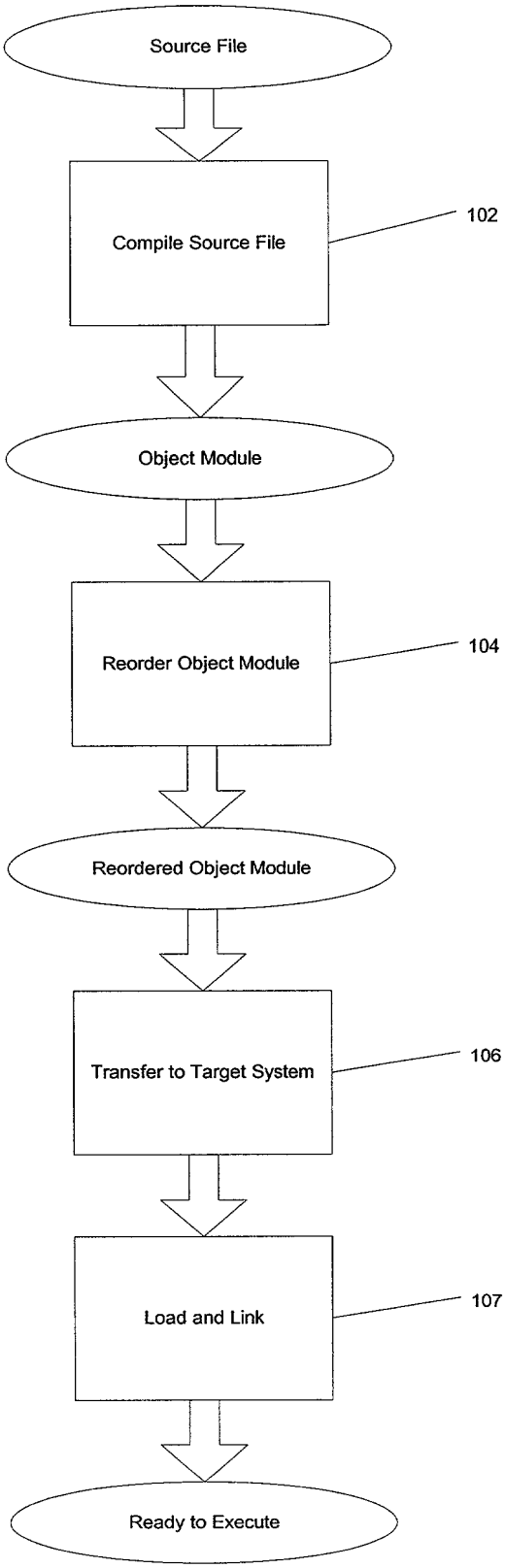

Source File
Compile Source File
102
Object Module
Reorder Object Module
104
Reordered Object Module
Transfer to Target System
106
Load and Link
107
Ready to Execute

Figure 1

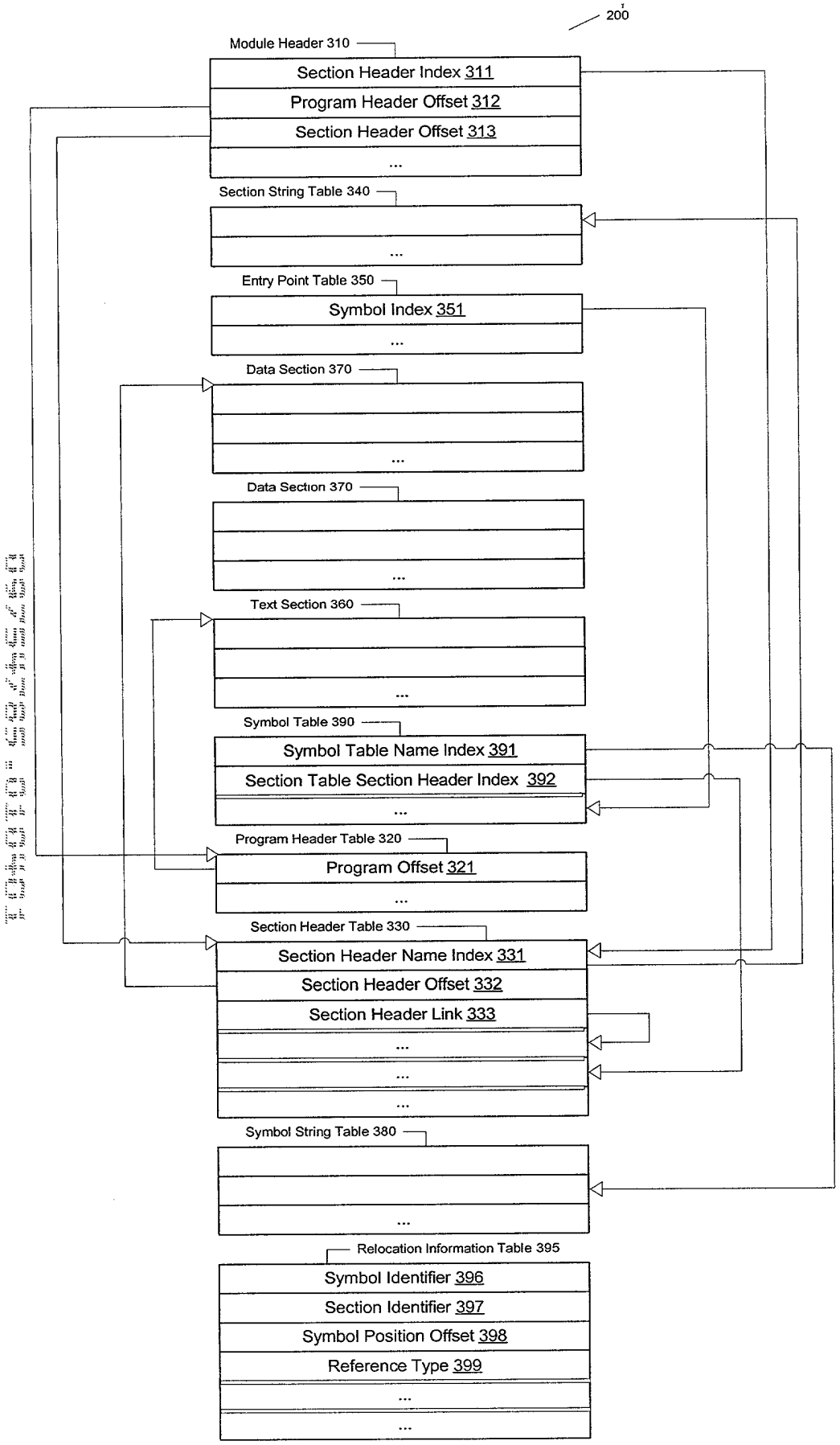

200
Module Header 310
Section Header Index 311
Program Header Offset 312
Section Header Offset 313
...
Section String Table 340
...
Entry Point Table 350
Symbol Index 351
...
Data Section 370
...
Data Section 370
...
Text Section 360
...
Symbol Table 390
Symbol Table Name Index 391
Section Table Section Header Index 392
...
Program Header Table 320
Program Offset 321
...
Section Header Table 330
Section Header Name Index 331
Section Header Offset 332
Section Header Link 333
...
...
...
Symbol String Table 380
...
Relocation Information Table 395
Symbol Identifier 396
Section Identifier 397
Symbol Position Offset 398
Reference Type 399
...
...

Figure 2

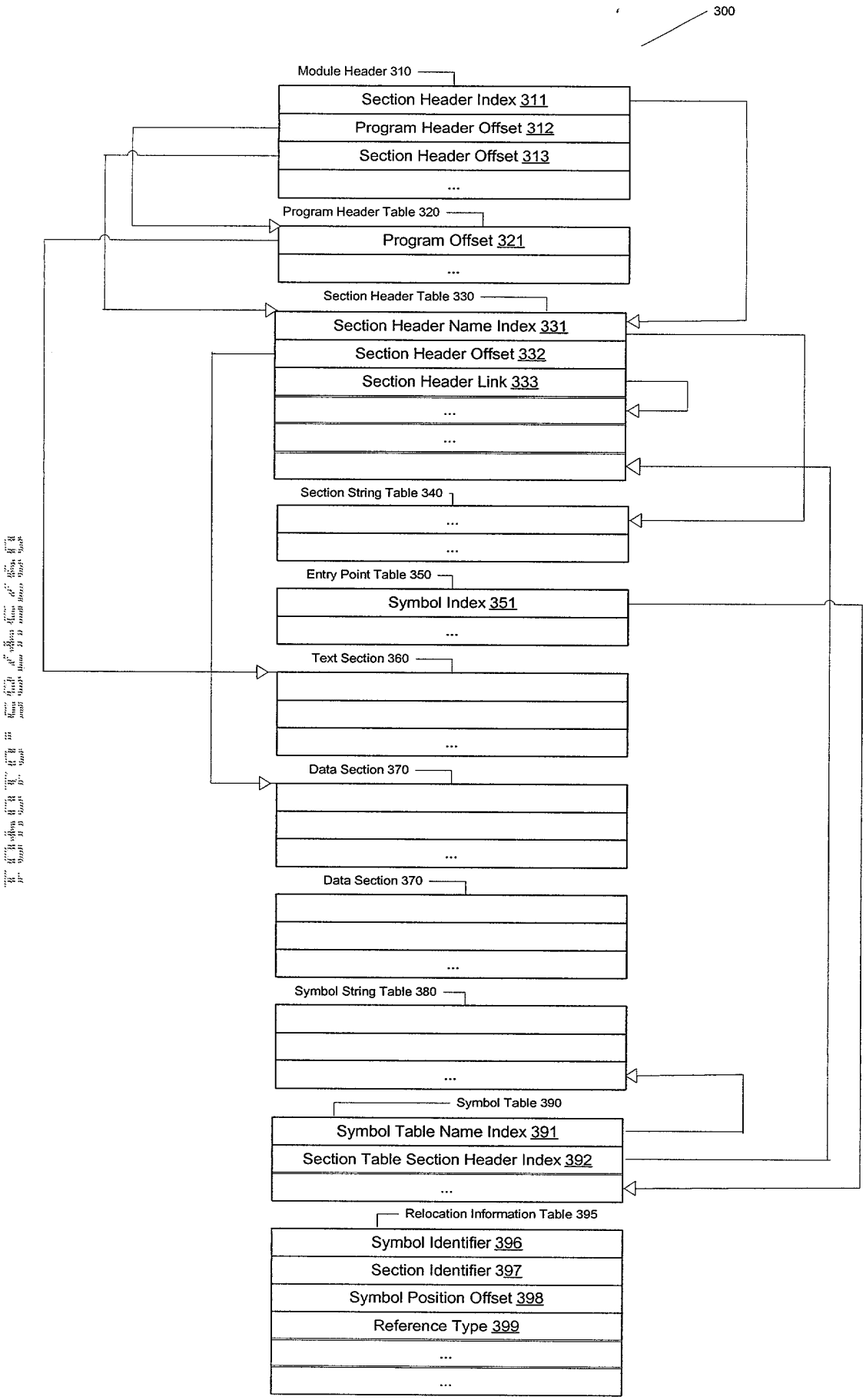

300
Module Header 310
Section Header Index 311
Program Header Offset 312
Section Header Offset 313
...
Program Header Table 320
Program Offset 321
...
Section Header Table 330
Section Header Name Index 331
Section Header Offset 332
Section Header Link 333
...
...
Section String Table 340
...
...
Entry Point Table 350
Symbol Index 351
...
Text Section 360
...
Data Section 370
...
Data Section 370
...
Symbol String Table 380
...
Symbol Table 390
Symbol Table Name Index 391
Section Table Section Header Index 392
...
Relocation Information Table 395
Symbol Identifier 396
Section Identifier 397
Symbol Position Offset 398
Reference Type 399
...
...

Figure 3

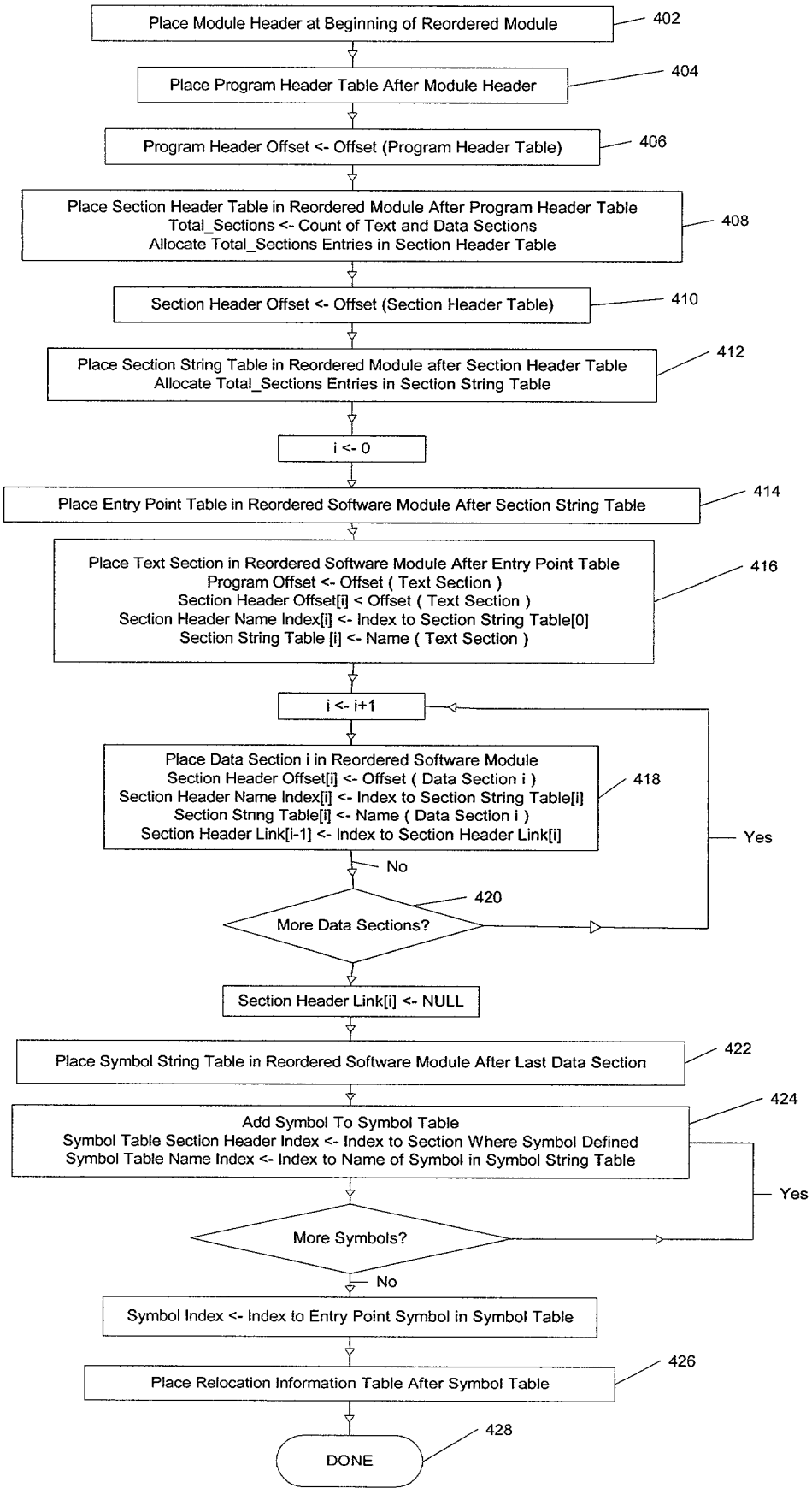

Place Module Header at Beginning of Reordered Module
402
Place Program Header Table After Module Header
404
Program Header Offset <- Offset (Program Header Table)
406
Place Section Header Table in Reordered Module After Program Header Table
Total_Sections <- Count of Text and Data Sections
Allocate Total_Sections Entries in Section Header Table
408
Section Header Offset <- Offset (Section Header Table)
410
Place Section String Table in Reordered Module after Section Header Table
Allocate Total_Sections Entries in Section String Table
412
i <- 0
Place Entry Point Table in Reordered Software Module After Section String Table
414
Place Text Section in Reordered Software Module After Entry Point Table
Program Offset <- Offset (Text Section)
Section Header Offset[i] < Offset (Text Section)
Section Header Name Index[i] <- Index to Section String Table[0]
Section String Table [i] <- Name (Text Section)
416
i <- i+1
Place Data Section i in Reordered Software Module
Section Header Offset[i] <- Offset (Data Section i)
Section Header Name Index[i] <- Index to Section String Table[i]
Section String Table[i] <- Name (Data Section i)
Section Header Link[i-1] <- Index to Section Header Link[i]
418
Yes
No
More Data Sections?
420
Section Header Link[i] <- NULL
Place Symbol String Table in Reordered Software Module After Last Data Section
422
Add Symbol To Symbol Table
Symbol Table Section Header Index <- Index to Section Where Symbol Defined
Symbol Table Name Index <- Index to Name of Symbol in Symbol String Table
424
Yes
More Symbols?
No
Symbol Index <- Index to Entry Point Symbol in Symbol Table
Place Relocation Information Table After Symbol Table
426
DONE
428

Figure 4

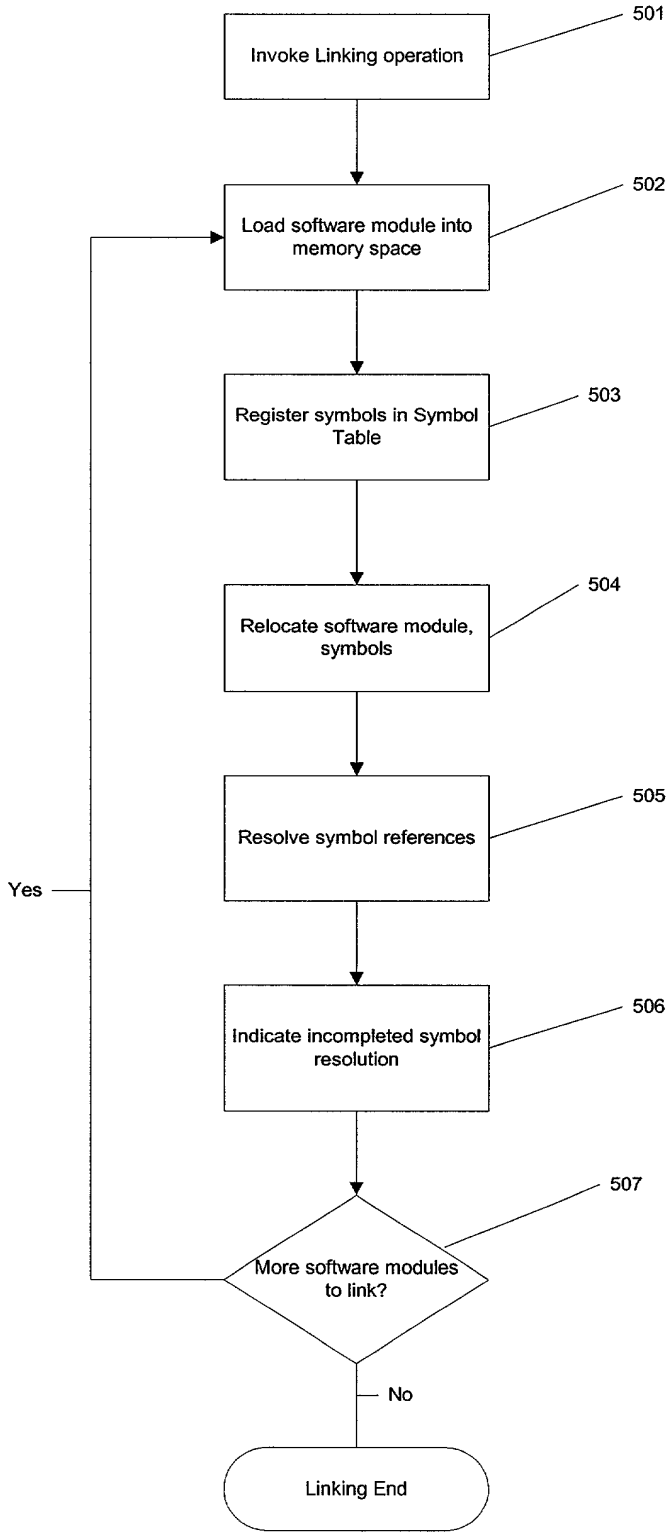

Invoke Linking operation
501
Load software module into memory space
502
Register symbols in Symbol Table
503
Relocate software module, symbols
504
Resolve symbol references
505
Indicate incompleted symbol resolution
506
More software modules to link?
507
Yes
No
Linking End

Figure 5

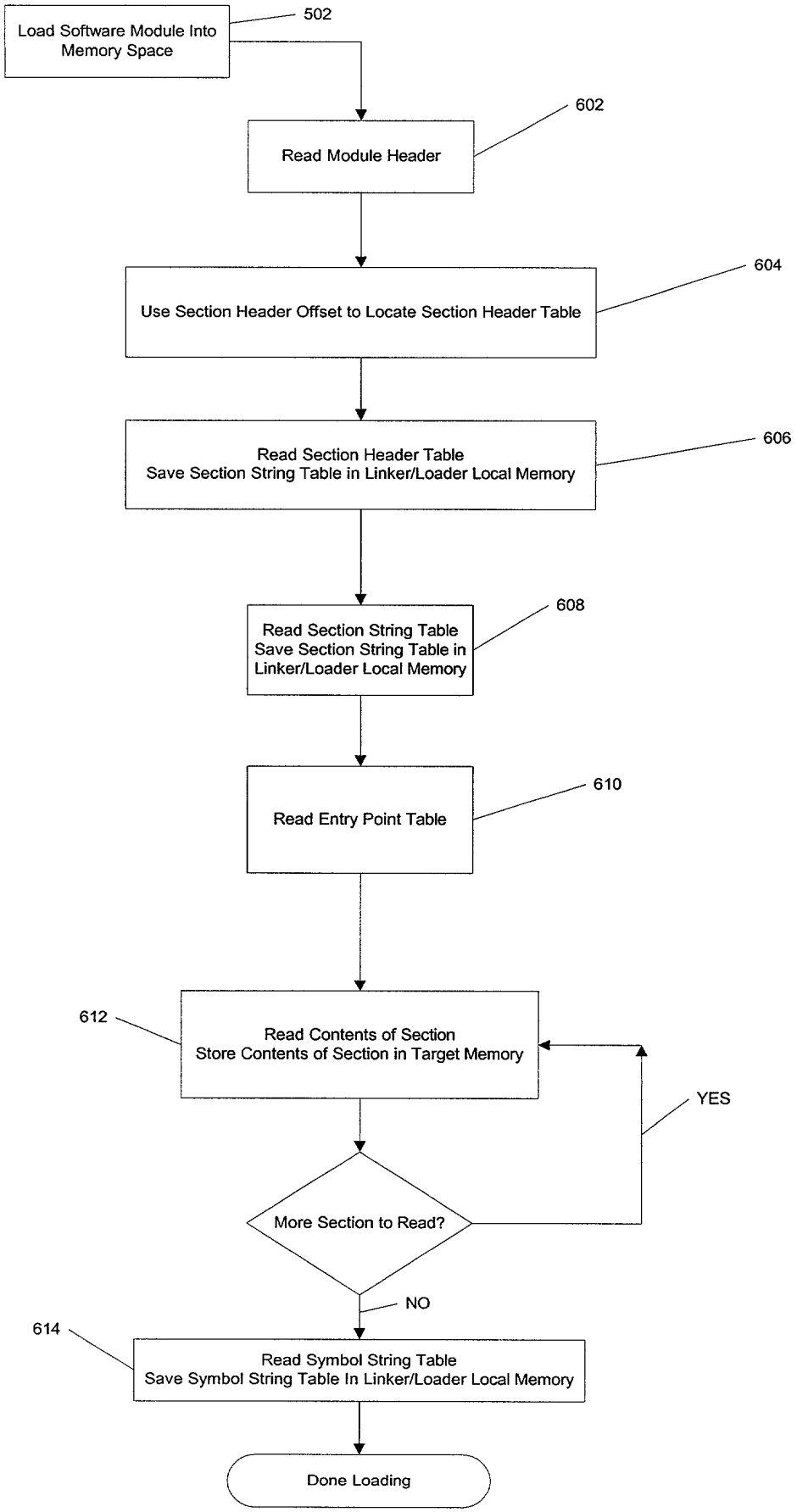

Load Software Module Into Memory Space
502
Read Module Header
602
Use Section Header Offset to Locate Section Header Table
604
Read Section Header Table
Save Section String Table in Linker/Loader Local Memory
606
Read Section String Table
Save Section String Table in Linker/Loader Local Memory
608
Read Entry Point Table
610
612
Read Contents of Section
Store Contents of Section in Target Memory
YES
More Section to Read?
NO
614
Read Symbol String Table
Save Symbol String Table In Linker/Loader Local Memory
Done Loading

Figure 6

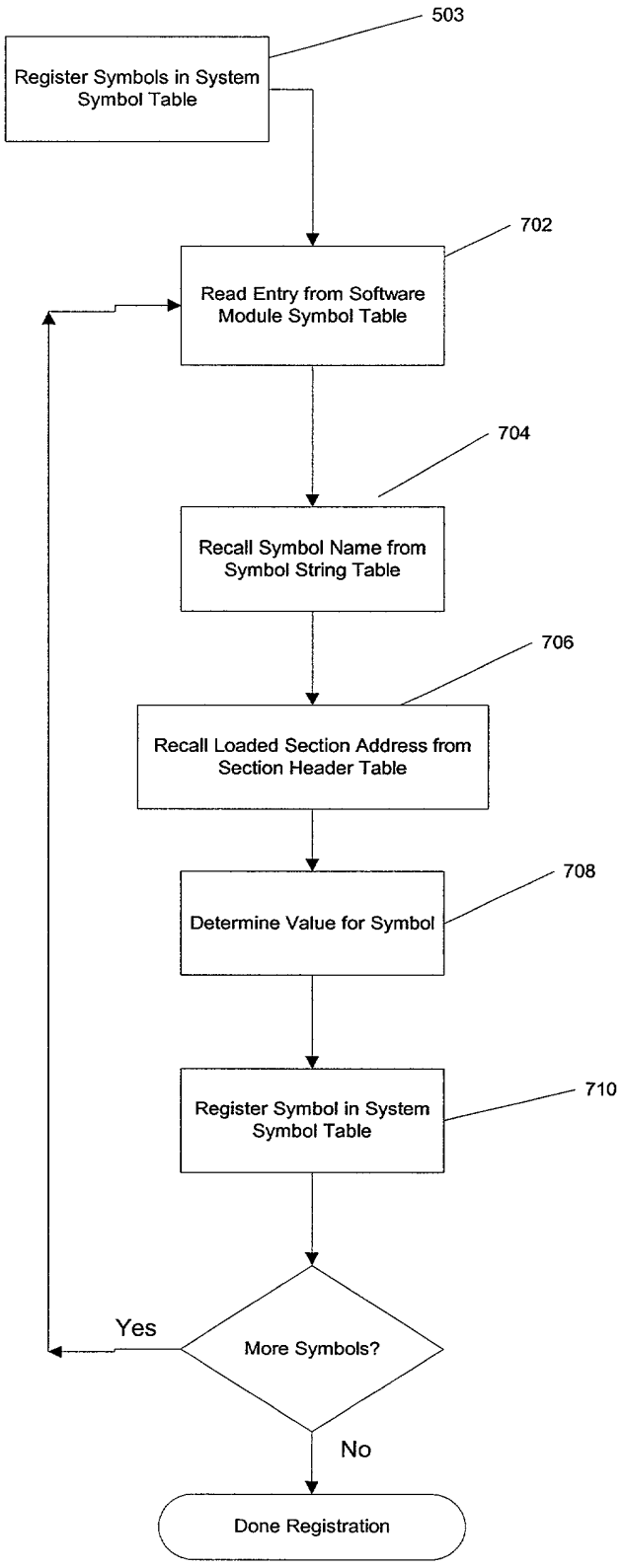

503
Register Symbols in System Symbol Table
702
Read Entry from Software Module Symbol Table
704
Recall Symbol Name from Symbol String Table
706
Recall Loaded Section Address from Section Header Table
708
Determine Value for Symbol
710
Register Symbol in System Symbol Table
More Symbols?
Yes
No
Done Registration

Figure 7

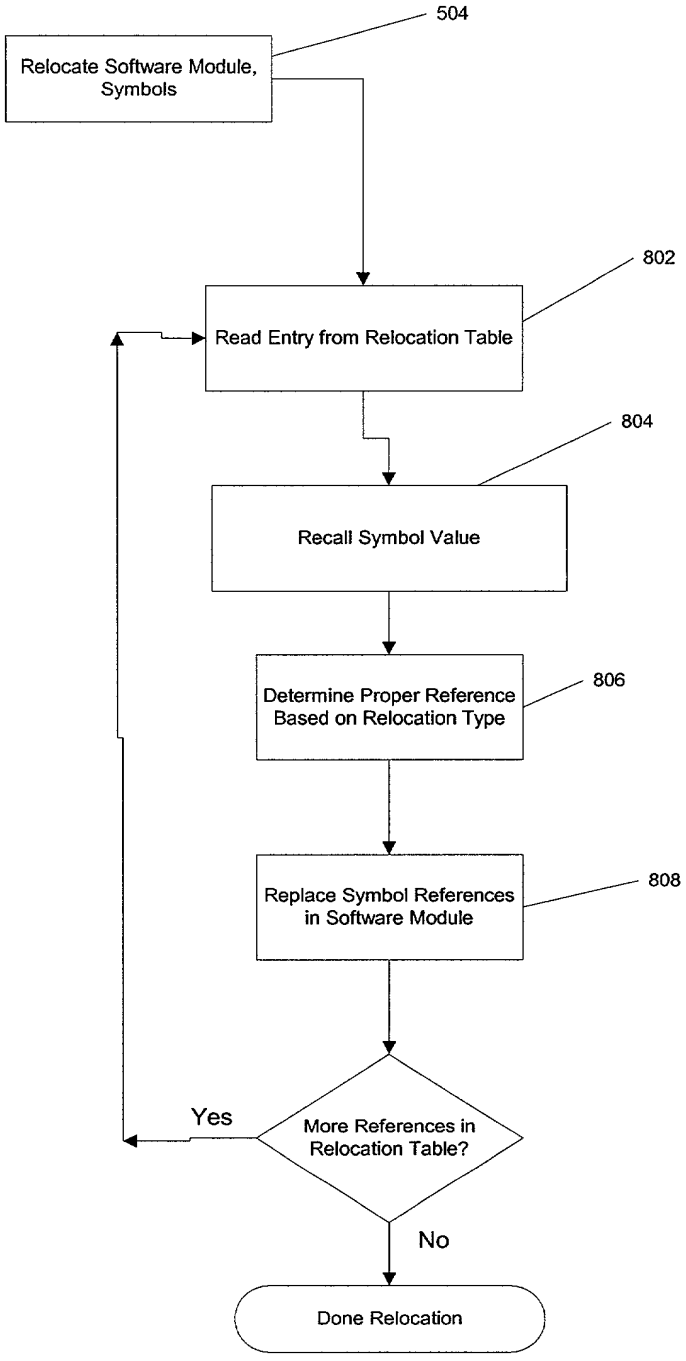

504
Relocate Software Module, Symbols
802
Read Entry from Relocation Table
804
Recall Symbol Value
806
Determine Proper Reference Based on Relocation Type
808
Replace Symbol References in Software Module
Yes
More References in Relocation Table?
No
Done Relocation

Figure 8

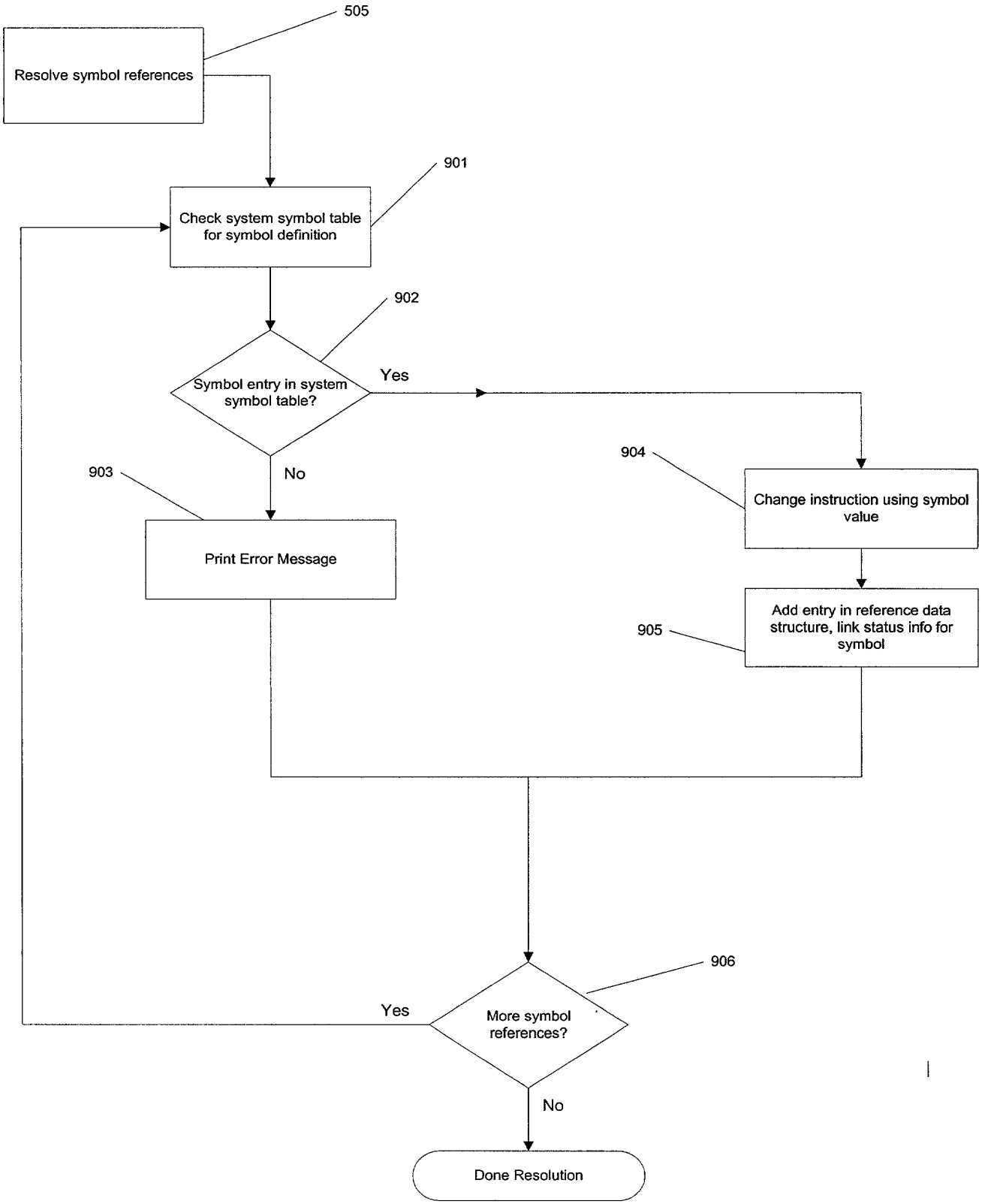

505
Resolve symbol references
901
Check system symbol table for symbol definition
902
Symbol entry in system symbol table?
Yes
No
903
Print Error Message
904
Change instruction using symbol value
905
Add entry in reference data structure, link status info for symbol
906
More symbol references?
Yes
No
Done Resolution

Figure 9

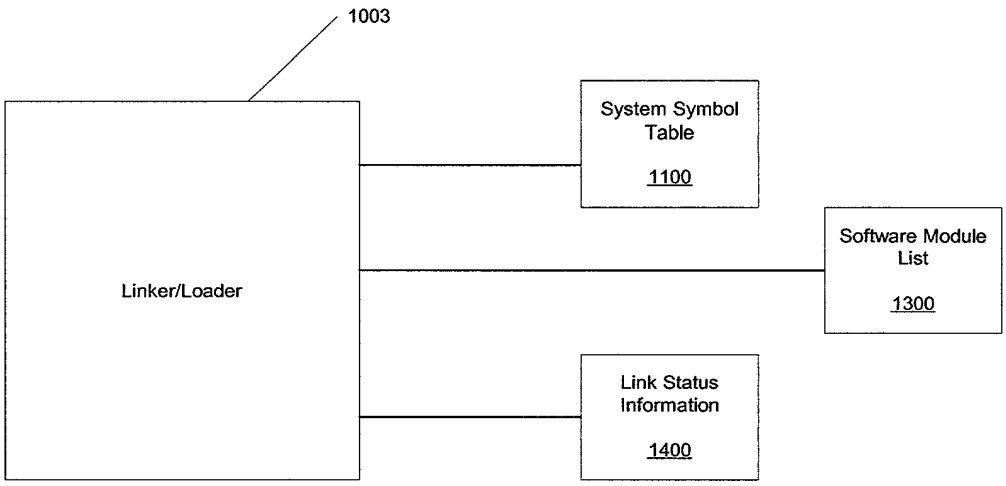

1003
Linker/Loader
System Symbol Table
1100
Software Module List
1300
Link Status Information
1400

Figure 10

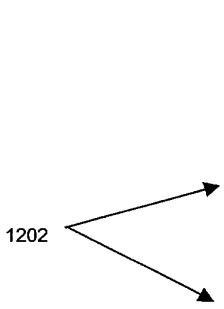
Electronic Patent Application Fee Transmittal

1100

Symbol	Symbol Value	Software Module Defining	Software Module References
<symbol_name_0>	<address_0>	<module>	[see Figure 12]
<symbol_name_1>	<address_1>	<module>	[see Figure 12]
<symbol_name_2>	<address_2>	<module>	[see Figure 12]
<symbol_name_3>	<address_3>	<module>	[see Figure 12]
. . .	. . .	. . .	. . .

1102

Figure 11



1200

Software Module	Reference Locations	Reference Offsets
<module_0>	<address_0>	<offset_0>
	<address_1>	<offset_1>
	<address_2>	<offset_2>
<module_1>	<address_0>	<offset_0>
<module_2>	<address_0>	<offset_0>
	<address_1>	<offset_1>
. . .	. . .	. . .

Figure 12

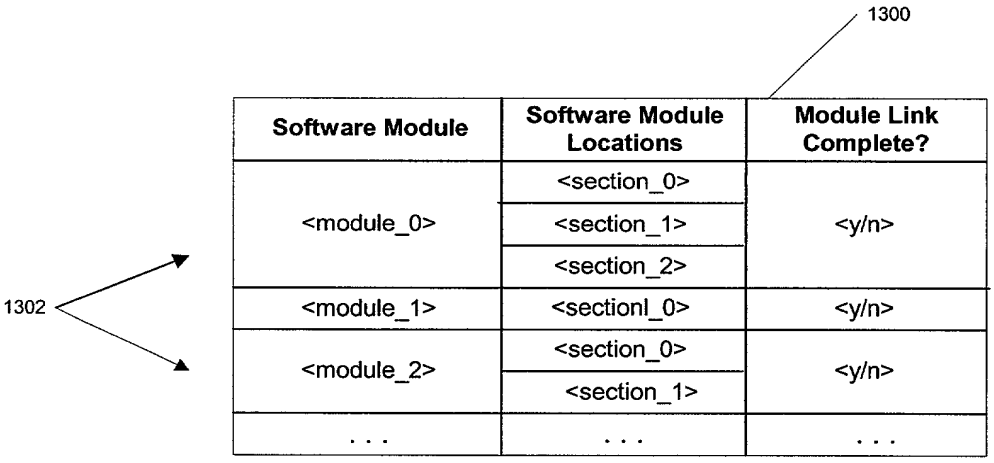

1300
1302
Software Module
Software Module Locations
Module Link Complete?
<module_0>
<section_0>
<section_1>
<section_2>
<y/n>
<module_1>
<sectionl_0>
<y/n>
<module_2>
<section_0>
<section_1>
<y/n>
. . .
. . .
. . .

Figure 13

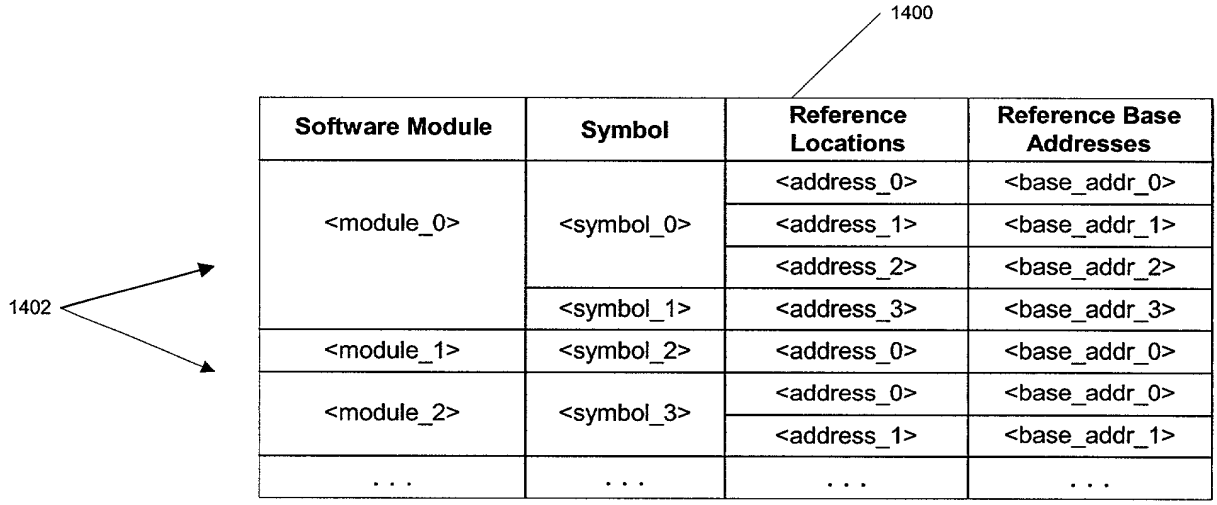

1400
1402
Software Module
Symbol
Reference Locations
Reference Base Addresses
<module_0>
<symbol_0>
<address_0>
<base_addr_0>
<address_1>
<base_addr_1>
<address_2>
<base_addr_2>
<symbol_1>
<address_3>
<base_addr_3>
<module_1>
<symbol_2>
<address_0>
<base_addr_0>
<module_2>
<symbol_3>
<address_0>
<base_addr_0>
<address_1>
<base_addr_1>
. . .
. . .
. . .
. . .

Figure 14

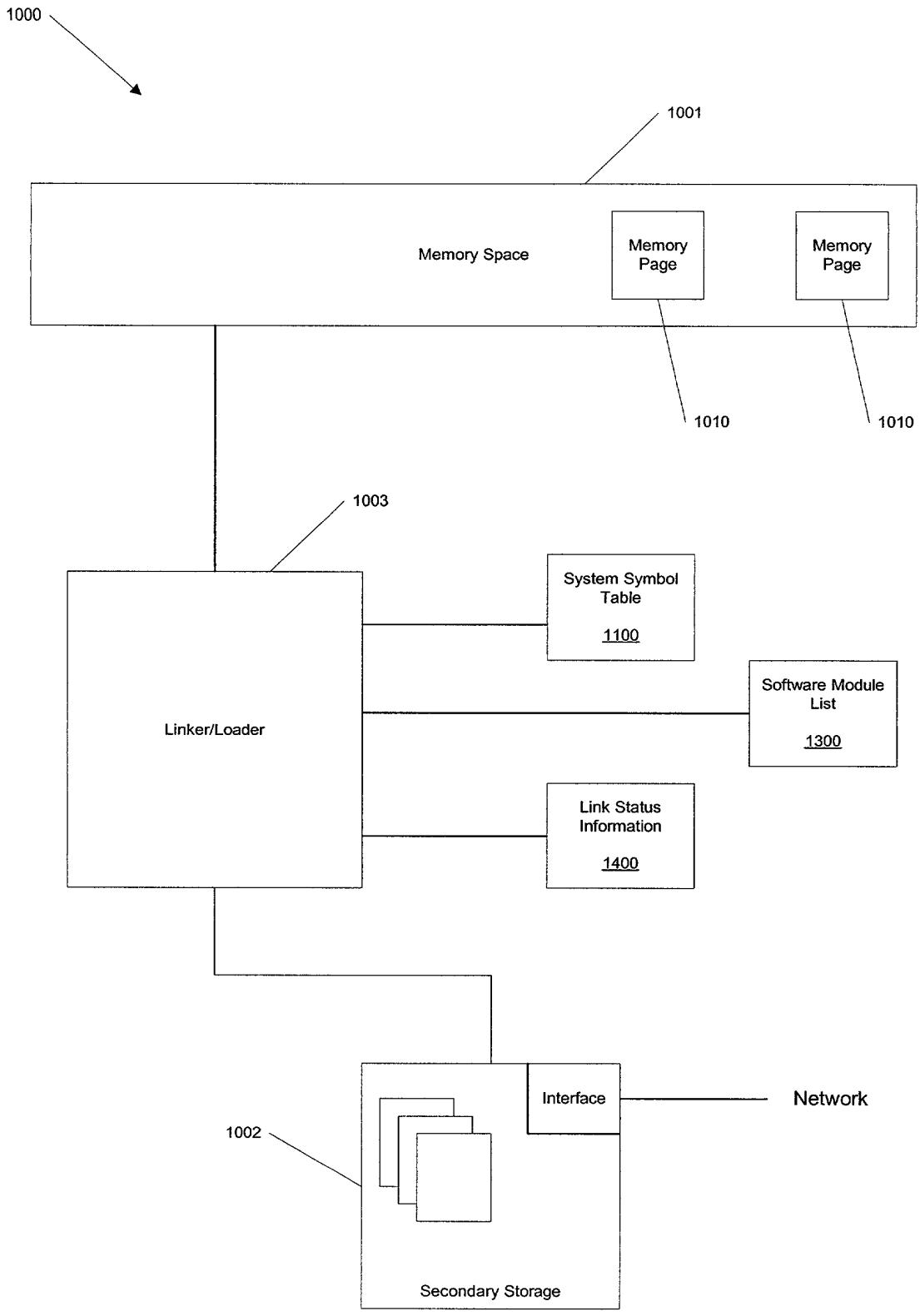

1000
1001
Memory Space
Memory Page
Memory Page
1010
1010
1003
Linker/Loader
System Symbol Table
1100
Software Module List
1300
Link Status Information
1400
Interface
Network
1002
Secondary Storage

Figure 15